Product Brochure

Anritsu

CMA5000a

Multi-layer Network Test Platform

Features

All-in-one support for installation and maintenance of each network layer

- Physical layer
- Data link layer
- Network layer
- Transport layer

Benefits

- Fast service roll-out
- Lower total costs

CMA5000a

Multi-Layer Network Test Platform

All-in-one Platform for SONET/SDH, OTN, Gigabit Ethernet, DWDM, OTDR, ORL, PMD, CD

Improved customer service, easy maintenance and lower costs are key issues for operators of high-speed data services.
The CMA5000a Multi-Layer Network Test Platform has a full range of versatile modules and easy to use touch panel, supporting fast network rollout and maintenance at lower total cost.

• Multi-measurement Functions

The CMA5000a measurement modules support SONET/SDH, OTN, 10 Gigabit Ethernet, Gigabit Ethernet, DWDM, OTDR, ORL, PMD, and CD measurements.
For field-testing, one unit supports all required physical layer, data link layer, network layer, and transport layer measurement items.

• Lower Total Cost of Ownership

One CMA5000a supports all measurements required for rolling out an optical network and maintenance follow-up. Multiple measurement modules can be set and operated simultaneously in one mainframe, eliminating the need for other single-function specialist measuring instruments and cutting total cost of ownership.
The easy to use touch panel and GUI shorten operator training too.

• Fast Service Roll-out

The consistent GUI between measurement modules simplifies work, allowing the operator to focus on evaluating each network layer efficiently and contributing to the fastest service rollout and maintenance.
A touch of a button can generate PDF-formatted report of measurement conditions and results.
Engineer can operate CMA5000a over Ethernet to support measurements at local site.

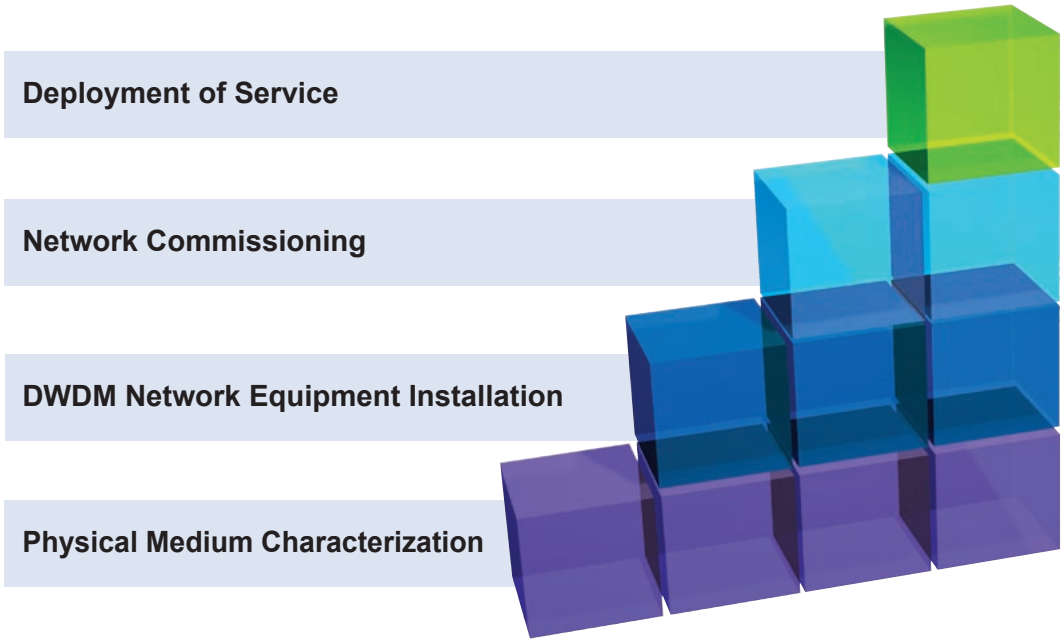
Platform

The open architecture and familiar PC GUI ensure that the CMA5000a can be updated to meet the evolving measurement needs of communications networks.
Two platforms of different sizes coupled with a full range of measurement modules assure support for every test requirement. High-performance measurement of every application cuts the time and cost of network installation and maintenance.

The CMA5000a features two types of bay adapter to hold a wide variety of application test modules, providing unsurpassed flexibility and scalability to reduce cost.

Small Bay Adapter (SBA)

Medium Bay Adapter (MBA)



Features and Benefits

1. Full range of I/O interfaces including Ethernet, VGA and USB 2.0 (4 ports)
2. Large 26.7cm (10.4") LCD with touch screen interface
3. Dedicated hard keys Measurement start/ stop, data recording, print, help, and more
4. Rotary encoder for easy and precise cursor movement
5. 40-GB hard disk and built-in DVD/CD-R/W
6. LEDs indicating external power, battery status and memory access

Deployment of Service

- Evaluate network parameters and maintain network performance

Network Commissioning

- Evaluate network performance and reliability
- Speed-up service rollout

Setting-up DWDM network equipment

- Set optimum bandwidth by tuning DWDM system

Evaluating Physical layer characteristics

- Easy installation of network equipment for evaluating Physical layer

CMA5000a Specifications

Item	Specification
Platform	SBA: 5000A-150-DC MBA: 5000A-250-DC
CPU/RAM	733 MHz Celeron/512 MB
Operating System	Windows® XP Pro SP2
Display	10.4” color XGA (1024 x 768) LCD (touch panel)
Hard Disk	40 GB
Media Drive	DVD/CD-R/W
Interface	Audio in/out VGA Output USB 2.0 (4 Ports) 10/100 Ethernet
Power	Auto-switching 100 to 240 Vac, 50/60 Hz 150 W
Dimensions and Mass	SBA: 371 (W) x 246 (H) x 140 (D) mm, 5.9 kg 14.6 (W) x 9.7 (H) x 5.5 (D) in 13 lbs MBA: 371 (W) x 246 (H) x 180 (D) mm, 6.81 kg 14.6 (W) x 9.7 (H) x 7.1 (D) in 15 lbs
Battery No.	SBA: 2 (one battery as standard accessory) * MBA: 2 (two batteries as standard accessory)
Battery Type	Li-Ion

*: Additional 5000A-BATT Battery may be required depending on module configurations. See "Mainframe and Module Configuration Guide" for details.

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Transmission Equipment and Network Performance Measurements

The CMA5000a support various transmission equipment and network performance measurements.
Its easy operation coupled with event log and reporting functions make it perfect for field measurements.

GigE II Module: Ethernet (10/100/1000BASE-T, 1000BASE-X)
UTA Module: SDH/SONET (156M to 9953 Mbit/s)
OTN (2.6G, 10.7G, 11.049G, 11.095G)
Ethernet (10GBASE-X, LAN-PHY/WAN-PHY)
XTA Module: SDH/SONET/PDH/DSn (1.5M to 9953 Mbit/s)
Jitter and Wander (1.5M to 2488 Mbit/s)
NGN (1.5M to 2488 Mbit/s)

With a full line of versatile modules, the all-in-one CMA5000a simplifies operation and cuts measurement costs.

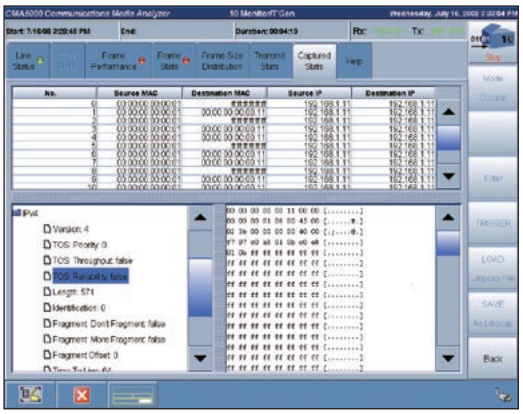
Gigabit Ethernet

The GigE II Module is a single unit supporting up to Gigabit Ethernet measurement with two RJ-45 ports for 10/100/1000BASE-T and two SFP ports for 1000BASE-X.
Optical 100M interface (100BASE-FX MMF) is also supported.
Users can identify both network faults and the root cause using flexible Tx stream generation, received frame analysis, and ping functions (Tx/Rx, Trace Route).
Moreover, the GigE II supports quality measurements of various services using sequence error, latency, and IP packet jitter measurement functions. The GigE II module has built-in support for RFC2544 applications and supports easy measurement of throughput, latency, and frame loss as well as back-to-back tests.
The unique BERT function supports line quality measurement using various data patterns.

Measurement Results of Two Ports with User Adjustable Thresholds

10 Gigabit Ethernet

The dual-size UTA Module supports various 10G interfaces for LAN-PHY/WAN-PHY 10 Gigabit Ethernet measurements. Utilizing swappable XFP modules as optical interfaces make wavelength switching easy.
Users can identify both network faults and the root cause using flexible Tx stream generation, received frame analysis, and ping functions (Tx/Rx) as well as a capture function with filtering/triggering.
In addition, the UTA module supports various service quality measurements using sequence error, latency and IP packet jitter measurement functions.
The RFC2544 application supports measurement of throughput, latency, and frame loss as well as easy back-to-back testing.



Analysis of Captured Data

Features and Benefits

GigE Module

- Multiple 10/100/1000BASE-T and 1000BASE-X interfaces

Performance:

- Performance measurements using RFC2544 auto test and powerful report functions
- Supports multiple PRBS patterns in addition to CRPAT for BERT tests
- Supports remote measurement using master/slave function

UTA Module

- Multiple interface units for SDH/SONET (156M to 9953 Mbit/s), OTN (2.6G, 10.7G, 11.1G) and Ethernet (10GBASE-X, LANPHY/WAN-PHY)

Performance:

- Choice of required interface cuts equipment costs
- ITU-T O.182 random error generation supports accurate measurement of OTN network performance
- Supports monitoring of next-generation SDH/SONET networks up to 9953 Mbit/s

Features and Benefits

XTA Module

- Choice of measurement module matching required bit rate, such as
  1.5M to 622 Mbit/s
  1.5M to 2488 Mbit/s
  1.5M to 9953 Mbit/s
  (1310 or 1550 nm for 9953 Mbit/s)

Performance:

- Supports PDH/DSn jitter/wander and NGN interfaces up to 2488 Mbit/s
- Supports SDH/SONET measurements up to 9953 Mbit/s

User interface:

- Mapping auto-analysis

CMA Ethernet Reflector

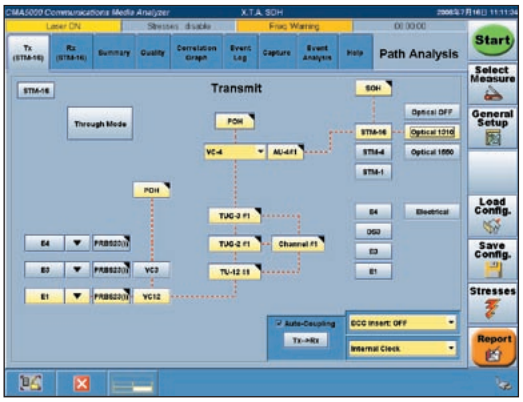
- Swap function supporting 10/100/1000BASE-T and 1000BASE-X

Performance:

- Easy Swap function
- Swap operation at full wire rate
- Auto negotiation

SDH/SONET

The dual-size UTA and XTA measurement modules support SDH/SONET interfaces from 156M to 9953M. In addition to offering various functions, such as alarm/error measurement, APS measurement with 125 µs resolution, and return delay measurement with 100 µs resolution, field troubleshooting and fault detection are made faster and easier by search and mapping auto-analysis. Additionally, installing the optional EoS (Ethernet over SDH/SONET) function supports next-generation SDH/SONET measurements, such as virtual concatenation, LCAS, and differential delay. The XTA unit supports ITU-T O.172-compliant PDH/DSn interfaces and jitter/wander measurements from 1.5M to 2488 Mbit/s.



Mapping Selection Window

OTN

The UTA Module supports OTN measurements as an option. It supports OTN 2.6G, 10.7G and 11.1G interfaces. Forward Error Correction (FEC) is a key index of OTN performance that the UTA Module can quantify with high reproducibility using its ITU-T O.182-compliant error generation function.

OTN Error and Alarm Display Showing Each Network Layer

CMA Ethernet Reflector

The CMA Ethernet reflector has 10/100/1000BASE-T and 1000BASE-X ports. It complements CMA5000a IP/Ethernet measurements by the function of swapping the source address and the destination address of the Ethernet frame.

External View of CMA Ethernet Reflector

Physical Layer Characterization

As a leader in optical fiber and network characterization, the CMA 5000a offers all of the test applications required for comprehensive physical layer characterization, including OTDR, Polarization Mode Dispersion, Chromatic Dispersion, Loss Test Set and Optical Return Loss. Supplemental tools such as a Visual Fault Locator and Video Inspection Probe are also available for a complete testing solution.

OTDR

The CMA5000a Optical Time Domain Reflectometer (OTDR) application represents a world-class measurement solution with the latest in high performance hardware and dedicated, easy to use software.

• High Performance Hardware

To satisfy the most demanding testing requirements, the CMA5000a series OTDR modules, feature a multitude of available wavelengths including 850, 1300, 1310, 1383, 1490, 1550 and 1625 nm.
For ultra-long haul systems, the CMA5000a OTDR modules feature up to 50 dB of dynamic range (enough to see approximately 250 km of fiber).

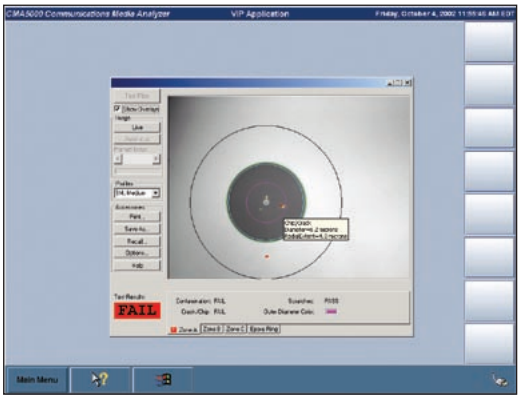
Full fiber characterization with the press of a button.

• Dedicated, Ease to Use Software

To simplify testing, the CMA5000a features dedicated testing modes to automate and simplify the task at hand. FAULT LOCATE mode is designed for the novice just starting out or someone who only uses an OTDR occasionally. Simply connect the fiber and press test, the unit will verify the fiber is connected correctly, select testing parameters, execute the test and provide a text response indicating fault/break location and end to end loss. For those who have more experience or would like to perform more advanced testing, STANDARD OTDR mode allows the user to select all parameters, compare up to eight traces and even generate splice loss reports. Cable commissioning is also automated through the use of CONSTRUCTION OTDR mode where a wizard allows the user to select the required testing wavelengths, number of fibers and file naming scheme. The wizard then becomes the project manager guiding the user through the testing and ensuring consistency with testing parameters, eliminating user induced errors.

Optical Fiber Connector Inspection

The Video Inspection Probe (VIP) gives operators a safe, easy way to analyze and document connector conditions. Since most optical network failures are attributed to poor connector quality, the VIP reduces the installation time and ensures the network is able to reach its full potential.
Connector images are captured digitally and displayed on the test set screen. The images can then be viewed or saved as a variety of common graphics files for later review or documentation of connector quality. Various adapters are available to allow direct viewing of patch cord end faces, as well as, for viewing of end faces already installed in patch panels.



Video Inspection Probe displays and captures fiber end face

Features and Benefits

OTDR

- Dedicated testing modes to simplify commonly performed tasks
- Easy to use for any skill level testing from fault location to advanced analysis
- Solutions for all network types: Metro, CWDM and ultra-long haul
- Extremely high resolution for accurate fiber mapping (0.5 meter resolution at 125 km, 1 meter resolution at 250 km)
- Superior event analysis software provides high accuracy and event detection capability
- Automated reporting
- Scripting command support for remote operation or automated testing in manufacturing environments

Features and Benefits

Optical Spectrum Analysis

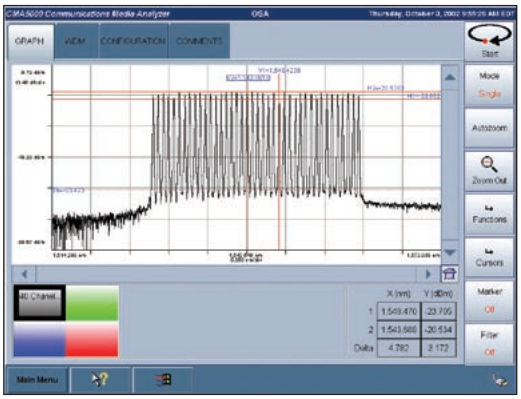
- Increased revenue through accurate channel characterization:
  ±40 pm wavelength accuracy
  ±0.4 dB power accuracy
- Channel Select option allows users to drop a wavelength with a flat top tunable filter
- Easy-to-use - one button complete spectral characterization
- User-defined configurations for custom DWDM testing
- Unsurpassed ORR (Optical Rejection Ratio)

Polarization Mode Dispersion

- Removing the auto-correlation peak for accurate characterization of all necessary PMD parameters: PMD, length PMD coefficient and second order PMD value
- Multiple test modes including multiple scans and long term PMD testing
- All band testing
- Highest dynamic range on the market: 55 dB with standard light source and more than 64 dB with the high power source
- Fast measurement time: less than 8 seconds
- Able to test through multiple EDFAs

DWDM Network Equipment

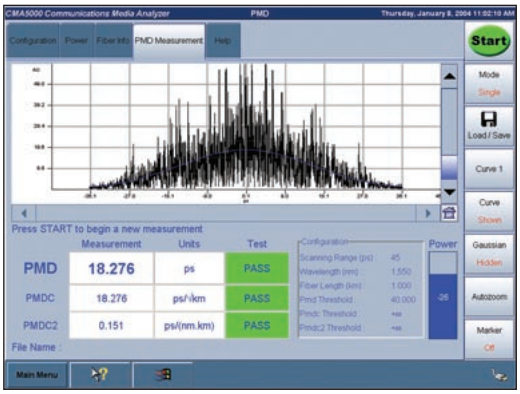
The OSA applications lower CWDM and DWDM installation and maintenance costs by providing industry leading spectral analysis of system critical parameters. Operating from 1250 to 1650 nm, these OSA modules for the CMA5000a are the tools for testing large wavelength range CWDM system.
The OSA provides laboratory grade specifications in a rugged field module and is ideal for critical measurements on DWDM systems.
With the tightest wavelength spacing and best ORR & OSNR available in a field package, it quickly and accurately identifies problems with source drift, output stability and optical amplifier operation. In addition, it features a unique flat-topped narrow band filter that can be used to drop a single channel (at speeds up to 40 Gbit/s) from the DWDM network for detailed transport testing.



Complete channel analysis including wavelength (or frequency), power, OSNR and system gain tilt for balancing your network

Polarization Mode Dispersion (PMD)

By performing complete PMD Characterization of your high data-rate networks, the CMA5000a PMD application helps optimize throughput and increase revenue. Its simple, one-button operation allows installers, carriers and system providers alike to release the full potential of their high line rate network spans.
The unique pi-shifted interferometric technique provides high accuracy and high dynamic ranges with a standard light source. This high performance module achieves tests through multiple EDFAs, reduces testing time by fast measurements, exceptional ease of use and covers all wavelength bands. It is fully compliant with TIA/EIA FOTP-124 and IEC60793-1-48 standards.



Determine if your fiber link meets PMD requirements

Chromatic Dispersion

The field portable CMA5000a OTDR/Chromatic Dispersion (CD-OTDR) measurement system is a dedicated module that combines the advanced capabilities of Anritsu's OTDR technology with Anritsu's experience in Chromatic Dispersion.
The CMA5000a CD-OTDR measurement system gives installers and network providers a combined module that can be used as an OTDR and a chromatic dispersion measurement system, reducing testing times while increasing network performance.
The CMA5000a CD-OTDR measurement system is based upon the industry accepted time-of-flight measurement method (FOTP-168) that can evaluate chromatic dispersion of individual fiber links. Utilizing a single fiber for the test and multiple wavelengths, results in an increase in the accuracy of the measurement, as well as, a reduction in the testing time. This translates into improved network performance and efficiency, resulting in increased revenue for the network provider.
Anritsu understands how valuable your time is, so we provide intuitive, easy-to-use setup menus and single-button operation. The CMA5000a CD-OTDR measurement system has been designed to provide optimal test efficiency to facilitate quicker turn-up of services and reduce the cost of testing.
The combined unit has an auto-test feature that will determine the optimum settings. In addition, intuitive setup menus guide the user through a few minor settings to minimize the testing and setup times.

Highly Accurate CD Measurement Using FOTP-168 Method

Features and Benefits

Increased revenue through optimal CD compensation:

- Measurement accuracy of 1% facilitates optimal compensation of CD and slope for increased channel count and data rate

Added value through performance:

- Dispersion, dispersion slope, λ0 and spectral attenuation for all fiber types

Reduced cost of measurement:

- Extremely short test time – seconds per fiber
- Easy-to-use, automated software with one button operation

Module Specifications

Module	Measurement	Platform	Bay
UTA	Network performance measurement 10G Ethernet LAN-PHY, WAN-PHY SONET (optical) OC3/12/48/192 SDH (optical) STM1/4/16/64 OTU1/2	SBA, MBA	2
GIGE II	Gigabit Ethernet performance measurement 10/100/1000 M Ethernet	SBA, MBA	1
XTA	SONET/SDH performance measurement DS1 to OC192/STM64 Jitter and Wander (up to 2.5G)	SBA, MBA	2
OSA	Optical spectrum analysis DWDM channel selection	MBA	4
OTDR	Optical Time Domain Reflectometer	SBA, MBA	1
PMD	Polarization mode dispersion measurement	MBA	4
CD-OTDR	Wavelength dispersion measurement Optical pulse test	SBA, MBA	1

See each module data sheet for detailed configurations.

Ordering Information

Please specify the model/order number, name and quantity when ordering.
The names listed in the chart below are Order Names. The actual name of the item may differ from the Order Name.

Model/Order No.	Description
Main frame	
5000A-150-DC-xx	SBA main frame featuring two bays
5000A-250-DC-xx	MBA main frame featuring four bays
	xx: Choose the accessory power cable from following: IT: Italy; SW: Switzerland; AU: Australia; EU: Europe; UK: Great Britain, US: USA, Japan
Accessories	
5000A-AC	replacement AC Adapter
CORD-C5-xx	replacement Power cable (xx: cable connector type)
STYLUS-3PK	replacement Touch panel stylus
5000A-OPMAN	replacement Quick Start Guide
Application Parts	
5000A-BATT	Additional Battery
USB-KEYBD-US	USB English keyboard with trackball
5000A-HCASE-SBA	Hard case for SBA main frame
5000A-HCASE-DLX	Hard case for SBA/MBA main frame with extra module capacity
5000A-SCASE	Soft case for SBA/MBA main frame

Note

Anritsu

Specifications are subject to change without notice.

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080929

Printed on Recycled Paper

Catalog No. CMA5000a-E-A-1-(3.00) Printed in Japan 2008-12 PSD

CMA5000a

Multi Layer Network Platform

Mainframe and Module Configuration Guide

This guide describes possible combinations of the CMA5000a mainframe and modules.

The all-in-one CMA5000a Multi Layer Network Platform supports cost-effective network installation and maintenance measurements.

Mainframe

There are two models of CMA5000a mainframe—the SBA (Single Bay Adapter), and the MBA (Medium Bay Adapter), each offering different numbers of bays as shown below.

SBA (2 bays)

MBA (4 bays)

Measurement Modules

Various modules for testing the physical and transport layers can be simultaneously installed in the CMA5000a.

Measurement Modules

Popular Name	Bay	Product Number	Description
ORL or Test Fiber	1	520-ORL-XX OPTION-55X-TFMXX	High-accuracy location of optical fiber breaks
OTDR	1	52XX-000-OTDR-XXX	Reflection measurement showing cut or bend of optical fibers
CD-OTDR	1	5302-21-CDOTDR-XXX	Chromatic dispersion measurement
GigE-II	1	5710-000-GIGE	Transmission quality measurement for 10, 100 and Gigabit Ethernet
GigE	2	5700-000-GIGE	Transmission quality measurement for 10, 100 and Gigabit Ethernet
10 GigE	2	5800-000-10GIGE	Transmission quality measurement for 10 Gigabit Ethernet
UTA	2	5610-000-UTA	Transmission quality measurement for 10 Gigabit Ethernet, 156M to 10G SDH/SONET and OTU1/2
2.5G XTA	2	5616-000-XTA	Transmission quality measurement for 1.5M to 2.5G PDH/SDH/SONET
10G XTA	2	566X-000-XTA	Transmission quality measurement for 1.5M to 10G PDH/SDH/SONET
622M XTA J&W	2	5604-000-XTA	Transmission quality measurement for 1.5M to 622M PDH/SDH/SONET including jitter and wander
2.5G XTA J&W	2	5616-301-XTA or 5616-311-XTA	1.5M to 2.5G Jitter wander measurement
2.5G XTA NGN	2	5616-601-XTA or 5616-611-XTA	156M to 2.5G GFP, LCAS, VCAT
OSA 400/425	4	55XX-X00-OSA-XXX	Optical spectrum measurement
PMD 160	4	5400-001-PMD-XX	Polarization mode dispersion measurement

Available Configurations

The charts below describe available configurations for mainframes (SBA and MBA) and measurement modules.

Note	Supported Models
ALL	All models
S-2	SBA with an additional battery (5000A-BATT) MBA
M	MBA
NO	Not supported

CMA5000a One-Module Configuration

Module	(Alone)
ORL or Test Fiber	ALL
OTDR	ALL
CD-OTDR	ALL
GigE-II	ALL
GigE	ALL
10 GigE	ALL
UTA	ALL
2.5G XTA	ALL
10G XTA	S-2
622M XTA J&W	S-2
2.5G XTA J&W	S-2
2.5G XTA NGN	S-2
OSA 400/425	M
PMD 160	M

CMA5000a Two-Module Configuration

Module	ORL or Test Fiber	OTDR	CD-OTDR	GigE-II	GigE	10 GigE	UTA	2.5G XTA	10G XTA	622M XTA J&W	2.5G XTA J&W	2.5G XTA NGN
ORL or Test Fiber	ALL	ALL	ALL	ALL	M	M	M	M	M	M	M	M
OTDR	ALL	ALL	S-2	ALL	M	M	M	M	M	M	M	M
CD-OTDR	ALL	S-2	S-2	ALL	M	M	M	M	M	M	M	M
GigE-II	ALL	ALL	ALL	ALL	M	M	M	M	M	M	M	M
GigE	M	M	M	M	M	M	M	M	M	M	M	M
10 GigE	M	M	M	M	M	M	M	M	M	M	M	M
UTA	M	M	M	M	M	M	M	M	M	M	M	M
2.5G XTA	M	M	M	M	M	M	M	M	M	M	M	M
10G XTA	M	M	M	M	M	M	M	M	M	M	M	M
622M XTA J&W	M	M	M	M	M	M	M	M	M	NO	NO	NO
2.5G XTA J&W	M	M	M	M	M	M	M	M	M	NO	NO	NO
2.5G XTA NGN	M	M	M	M	M	M	M	M	M	NO	NO	M

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CMA5000a Three-Module Configuration

Module		ORL or Test Fiber	OTDR	CD-OTDR	GigE-II	GigE	10 GigE	UTA	2.5G XTA	10G XTA	622M XTA J&W	2.5G XTA J&W	2.5G XTA NGN
ORL or Test Fiber	ORL or Test Fiber	M	M	M	M	M	M	M	M	M	M	M	M
ORL or Test Fiber	OTDR	M	M	M	M	M	M	M	M	M	M	M	M
ORL or Test Fiber	CD-OTDR	M	M	M	M	M	M	M	M	M	M	M	M
ORL or Test Fiber	GigE-II	M	M	M	M	M	M	M	M	M	M	M	M
OTDR	OTDR	M	M	M	M	M	M	M	M	M	M	M	M
OTDR	CD-OTDR	M	M	M	M	M	M	M	M	M	M	M	M
OTDR	GigE-II	M	M	M	M	M	M	M	M	M	M	M	M
CD-OTDR	CD-OTDR	M	M	M	M	M	M	M	M	M	M	M	M
CD-OTDR	GigE-II	M	M	M	M	M	M	M	M	M	M	M	M
GigE-II	GigE-II	M	M	M	M	M	M	M	M	M	M	M	M

CMA5000a Four-Module Configuration

Module		ORL or Test Fiber	ORL or Test Fiber	ORL or Test Fiber	ORL or Test Fiber	OTDR	OTDR	OTDR	CD-OTDR	CD-OTDR	GigE-II
		ORL or Test Fiber	OTDR	CD-OTDR	GigE-II	OTDR	CD-OTDR	GigE-II	CD-OTDR	GigE-II	GigE-II
ORL or Test Fiber	ORL or Test Fiber	M	M	M	M	M	M	M	M	M	M
ORL or Test Fiber	OTDR	M	M	M	M	M	M	M	M	M	M
ORL or Test Fiber	CD-OTDR	M	M	M	M	M	M	M	M	M	M
ORL or Test Fiber	GigE-II	M	M	M	M	M	M	M	M	M	M
OTDR	OTDR	M	M	M	M	M	M	M	M	M	M
OTDR	CD-OTDR	M	M	M	M	M	M	M	M	M	M
OTDR	GigE-II	M	M	M	M	M	M	M	M	M	M
CD-OTDR	CD-OTDR	M	M	M	M	M	M	M	M	M	M
CD-OTDR	GigE-II	M	M	M	M	M	M	M	M	M	M
GigE-II	GigE-II	M	M	M	M	M	M	M	M	M	M

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